



National Aeronautics and  
Space Administration  
**Lyndon B. Johnson Space Center**  
Houston, Texas



## Rodeo roundup

The Houston Livestock Show and Rodeo comes to JSC with a variety of activities. Story on Page 3.



## EOC checkout

JSC Director George Abbey shows community leaders the state-of-the-art emergency facility. Photo on Page 4.

# Space News Roundup

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## Advanced life support system test begins

A four-person team is once again living in a special air-tight chamber at JSC testing recyclable life support systems.

The Phase IIA - International Space Station Life Support Test is the third in a series being conducted at JSC that uses physicochemical and biological methods to recycle air and water. The four-person volunteer crew entered the three-story chamber on Jan. 13 to spend up to 60 days investigating the use of mechanical and chemical means to recycle all air and water, including urine, for the volunteers. These physicochemical air and water processors are the same types that will be used on the International Space Station.

The test crew members are Crew Leader Terry Tri, project manager for the Bioregen-

erative Life Support Systems Complex; Karen Meyers, Lockheed Martin project engineer; Fred Smith, systems engineer; and Dave Staat, Lockheed Martin facilities project engineer. They plan to remain in the chamber until mid-March to evaluate the effectiveness of the station regenerative life support systems.

Regenerative life support is critical technology not only for the International Space Station but for the future of humans in space as astronauts will not be able to carry all of the supplies necessary to support a trip to Mars or the Moon. The current test continues the investigations begun on two previous tests conducted in August 1995 and June 1996.

In the first test, one volunteer spent two weeks in a smaller chamber using a crop of

wheat plants to recycle available breathing air. That test was followed by a 30-day test in 1996 with four volunteers in the 20-foot chamber evaluating the effectiveness of advanced systems to recycle their air and water.

The current test employs mechanical and chemical systems that are functionally the same as those that will be used on board the space station to purify the air and water supplies. The team members provide daily status reports on the operation of the air revitalization and water recovery systems, as well as crew habitability criteria. The team also is supporting evaluation of other space station planned activities including medical, food systems and specialized shifts for staffing monitoring consoles in the control room.



JSC Photo by Robert Markowitz

**The International Space Station Life Support Test team members enter the special air-tight chamber where they will spend up to 60 days investigating the use of mechanical and chemical means to recycle air and water. From left are, Karen Meyers, Terry Tri, Fred Smith and Dave Staat.**



NASA photo

**The STS-81 and Mir 22 crews take time out from five days of docked operations to salute the Houston Livestock Show and Rodeo. Back row from left are, STS-81 Pilot Brent Jett, STS-81 Mission Specialist Marsha Ivins and John Grunsfeld, Mir 22 Flight Engineer Alexander Kaleri and STS-81 Mission Specialist John Blaha. Front row from left are, STS-81 Mission Specialist Jeff Wisoff, STS-81 Commander Mike Baker, Mir 22 Commander Valeri Korzun and Mir 22 Flight Engineer Jerry Linenger.**

## Americans exchange places aboard Russian outpost for second time

By Kelly Humphries

John Blaha is back on Earth, on schedule, but the American presence on the Russian space outpost Mir continues as Jerry Linenger settles into his new home.

Blaha arrived back on *terra firma* Wednesday morning after a total of 128 days in orbit, 118 of those spent—for all intents and purposes—in a foreign country.

"Welcome! Welcome! Welcome!" Blaha said on Jan. 14, when the hatches between *Atlantis* and Mir opened and a raucous round of greetings began. "Welcome to space station Mir, a truly international space station."

Moments earlier, STS-81 Commander Mike Baker and Mir 22 Commander Valeri Korzun had embraced in the docking adapter connecting the two spacecraft, and pilots, flight engineers and mission specialists reveled in each other's companionship.

In addition to the exchange of

crew members—which occurred officially at 3:45 a.m. CST Jan. 15 when their form-fitted Soyuz seat liners were swapped in the small spacecraft that is used for return to Earth—Mission Specialist Marsha Ivins, Jeff Wisoff and the rest of the crew toted

three tons of equipment, supplies and experiment samples back and forth between the two spacecraft. Another 1,600 pounds of drinking water were transferred to Mir's tanks using contingency liquid containers. The supplies and equipment will be used by Linenger and his crew mates as they conduct research over the

next several months.

During a joint news conference, the Mir commander said, "We have the greatest impression of the work we did together and the friendship we developed over the four months onboard."

"I think this program is not only about space exploration but also

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## Atlantis modification work to be performed at Palmdale facility

United Space Alliance has recommended, and NASA managers have concurred, that upcoming modification and normal inspection work on *Atlantis* be done at Boeing North American's facility in Palmdale, Calif.

Over the past several months, USA, the shuttle prime contractor, has been evaluating whether the next Orbiter Maintenance Down Period on *Atlantis*, would be done at Palmdale or at Kennedy Space Center.

In making the decision to have the work done at Palmdale, several factors were considered.

First, the major modifications planned for *Atlantis* are extensive and will require a long and uninterrupted stay in a processing facility. If this work were performed at KSC, the long stay would represent a threat to the shuttle flight schedule for fiscal year 1998, which includes the first two International Space Station assembly flights and the final two shuttle-Mir missions for the Phase 1 program.

Secondly, the modifications planned for *Atlantis* are similar to those performed on *Discovery* and *Endeavour* while those two orbiters were at Palmdale. Using Palmdale's

resources will allow the program to take maximum advantage of the experience gained during the maintenance and modification work performed on the other two vehicles.

Managers also believe the extent of modifications required on *Atlantis* can better be accomplished in a manufacturing operation than in a mission turn-around processing effort. NASA concluded that, as with *Discovery* and *Endeavour*, these modifications should be performed by a dedicated team instead of a shared resource approach. The manufacturing environment and dedicated

team are both available at Palmdale.

Finally, with the modification work done at Palmdale, the KSC workforce can devote its attention to the principal activity of vehicle processing for launch and landing operations.

*Atlantis* will begin its OMDP session following completion of STS-86 in September. Modification work will include the installation of an external airlock in the payload bay.

Managers will examine many factors when making future decisions, including the complexity of required modifications and programmatic considerations.

## JSC workers compete in marathon

*More than 40 employees brave icy conditions*

Despite the icy conditions, several JSC employees made the trek to Houston's George R. Brown Convention Center to compete in the 25th running of the Methodist Health Care Houston Marathon.

"It was really cold, and nasty," said Mark Anderson of the Science Payloads Management Office, who finished the 26 miles, 385 yards in 3 hours, 5 minutes and 14 seconds. "We had the entire previous week to think about the weather, and it turned out every bit as bad as predicted. During the race, the temperature hovered near the 30 degree mark, with off-and-on freezing rain, and wind."

Runners prepared by wearing extra clothing at the start, such as long sleeved shirts, jackets, gloves and knit hats.

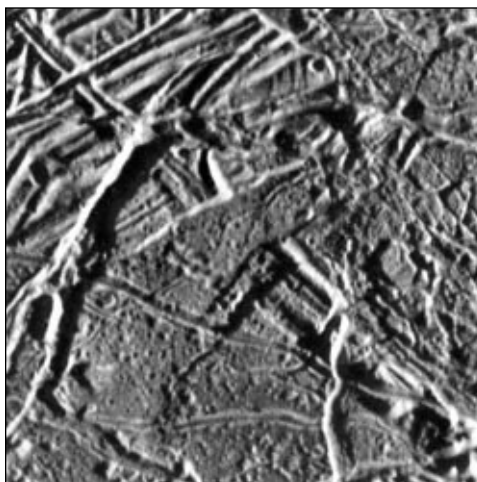
"Garbage bags were especially popular," said Anderson. "They're lightweight, they do a

good job of keeping out wind and some of the rain, and they can be thrown away when you no longer need them."

Although the extra clothing helped, it only made a bad situation somewhat more bearable. At some point in the race everyone was wet and cold, and facing the prospect of many miles ahead in the same condition.

"We all knew it would be that way, and yet, nobody rolled over and went back to sleep that morning," Anderson said. "Once we had committed, we had to see it through, or at least try. People who don't run marathons think, and maybe rightfully so, that we have to be a little crazy to run one of these, but it takes three to six months to prepare and, though everybody hated the weather conditions, no one was willing to back out."

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**The ice-rich surface of Europa has been broken into a complex pattern by cross-cutting ridges and grooves resulting from tectonic processes.**

## Ice volcanoes reshape Europa

NASA's Galileo spacecraft images reveal ice-spewing volcanoes and grinding and tearing tectonic plates that are reshaping the chaotic surface of Jupiter's moon Europa.

The images were captured when Galileo flew within just 430 miles of Europa on Dec. 19. Although the images do not show currently active ice volcanoes, they do reveal flows of material on the surface that probably originated from them, said imaging team member Ronald Greeley of Arizona State University.

"This is the first time we've seen actual ice flows on any of the moons of Jupiter," said Greeley. "These flows appear to be remnants of ice volcanoes or geysers."

The new images appear to enhance Europa's prospects as one of the places in

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